ACCESSION #: 9609110297

LICENSEE EVENT REPORT (LER)

FACILITY NAME: COMMANCHE PEAK STEAM ELECTRIC PAGE: 1 OF 6

STATION UNIT 1

DOCKET NUMBER: 05000445

TITLE: AUTOMATIC REACTOR TRIP CAUSED BY LIGHTNING STRIKE

EVENT DATE: 08/09/96 LER #: 96-007-00 REPORT DATE: 09/06/96

OTHER FACILITIES INVOLVED: CPSES UNIT 2 DOCKET NO: 05000446

OPERATING MODE: 1 POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:

50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:

NAME: RAFAEL FLORES - SYSTEM TELEPHONE: (817) 897-5590

ENGINEERING MANAGER

COMPONENT FAILURE DESCRIPTION:

CAUSE: SYSTEM: COMPONENT: MANUFACTURER:

REPORTABLE NPRDS: N

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On August 09, 1996, at approximately 12:03 p.m., TU Electric was performing a normal surveillance test procedure on Power Range Neutron Flux Channel N-43. This testing required that the Overtemperature (OT) N-16 trip function, which uses the N-43 as an input, to be placed in the TRIP condition. While the Power Range Channel N-43 was in test, a severe lightning storm was occurring outside. A lightning strike caused the Channel IV T sub cold to spike high which resulted in OT N-16 setpoint reduction and a subsequent trip signal. This completed the two-out-of-four logic for a reactor trip on OT

N-16. All rods fully inserted into the core. The plant equipment response to the reactor trip was consistent with that expected for the existing plant conditions.

The cause of the reactor trip was deemed to be lighting strike coupled with the Power Range Channel N-43 being in the trip position. Management's expectations will be issued to plant personnel with respect to scheduling and/or suspension of tests/surveillances, which could impact plant operations, during severe weather.

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1. DESCRIPTION OF THE REPORTABLE EVENT

A. REPORTABLE EVENT CLASSIFICATION

An event or condition that resulted in a manual or automatic

actuation of any Engineered Safety Feature (ESF) including the

Reactor Protection System (RPS).

B. PLANT OPERATING CONDITIONS PRIOR TO THE EVENT

On August 9, 1996, Comanche Peak Steam Electric Station (CPSES)

Unit 1 was in Mode 1, Power Operation, and operating at 100

percent power.

C. STATUS OF STRUCTURES, SYSTEMS, OR COMPONENTS THAT WERE

INOPERABLE AT THE START OF THE EVENT AND THAT CONTRIBUTED TO

THE EVENT

Power Range Channel N-43 was in 'TEST' for channel calibration.

This condition requires that the power range high neutron flux

and overtemperature N-16 reactor trip functions be placed in

the TRIP condition. There were no other inoperable structures,

systems or components that contributed to the event.

D. NARRATIVE SUMMARY OF THE EVENT, INCLUDING DATES AND

APPROXIMATE

TIMES

On August 9, 1996, at approximately 12:03 p.m., Instrument and Control Technicians (Utility, Non-Licensed) were performing a normal surveillance test procedure on power range channel N-43 (EIIS:(CHA)(JC)). This testing required that (Channel III) the Overtemperature (OT) N-16 trip function, which uses the N-43 as an input, to be placed in the TRIP condition. While power range channel N-43 was in test, unknown to the Operations Staff (due to locality of the control room), a severe lightning storm was occurring outside. A lightning strike caused the Channel IV T sub cold to spike high which resulted in OT N-16 setpoint reduction and Channel IV to trip. This completed the two-out-of-four logic for a reactor trip on OT N-16. All rods fully inserted into the core. The steam dump bypass control system operated properly, and the reactor coolant system (EIIS:(AB)) was at a T sub ave no load condition of 557 degrees F Plant Operators (Utility, Licenced) manually started both motor-driven auxiliary feedwater pumps

(EIIS:(P)(BA)) when steam generator (EIIS:(SG)(SB)) water level decreased to 30 percent narrow range in anticipation of the auto start signal at a steam generator water level of 25

percent narrow range. This Steam Generator water level

decrease was expected. All other emergency core cooling

systems and the emergency diesel generators were fully operable

if needed.

An event or condition that results in an automatic or manual

actuation of any ESF, including the RPS, is reportable within 4

hours under 10CFR50.72(b)(2)(ii). At approximately 1:20 p.m.

on August 9, 1996, the Nuclear Regulatory Commission Operations

Center was notified of the event via the Emergency Notification

System.

E. THE METHOD OF DISCOVERY OF EACH COMPONENT OR SYSTEM FAILURE, OR

PROCEDURAL OR PERSONNEL ERROR

The Control Room Staff received an Overtemperature N-16 alarm.

II. COMPONENT OR SYSTEM FAILURES

A. FAILED COMPONENT INFORMATION

Not applicable - there were no component failures associated

with this event.

B. FAILURE MODE, MECHANISM, AND EFFECT OF EACH FAILED COMPONENT

Not applicable - there were no component failures associated

with this event.

C. CAUSE OF EACH COMPONENT OR SYSTEM FAILURE

Not applicable - there were no component failures associated

with this event.

D. SYSTEMS OR SECONDARY FUNCTIONS THAT WERE AFFECTED BY FAILURES

OF COMPONENTS WITH MULTIPLE FUNCTIONS

Not applicable - there were no component failures associated

with this event.

III. ANALYSIS OF THE EVENT

A. SAFETY SYSTEM RESPONSES THAT OCCURRED

The lightning strike caused the Channel IV T sub cold to spike

high which resulted in OT N-16 setpoint reduction and Channel

to trip. This completed the two-out-of-four logic for a

reactor trip on OT N-16. All rods fully inserted into the

core. The steam dump bypass control system operated properly,

and the reactor coolant system was at a T sub ave no load

condition of 557 degrees F. The plant tripped on OT N-16.

Plant Operators (Utility, Licenced) manually started both

motor-driven auxiliary feedwater pumps when steam generator

water level decreased to 30 percent narrow range in

anticipation of the auto start signal.

B. DURATION OF SAFETY SYSTEM TRAIN INOPERABILITY

Not applicable - there was no safety system train inoperability

that resulted from this event.

C. SAFETY CONSEQUENCES AND IMPLICATIONS OF THE EVENT

The subject reactor trip was caused due to a lightning strike, which spiked Unit 1 Channel IV T sub cold high (approximately 568 degrees F). This condition resulted in the automatic reduction of the overtemperature reactor trip setpoint to approximately 64 percent Rated Thermal Power (RTP). The Overtemperature N-16 setpoint for Channel III was in trip position as a consequence of the surveillance testing being performed on N-43. Because the plant was being operated at 100 percent RTP, the two out of four logic for the overtemperature N-16 trip function was met, resulting in the trip of Unit 1.

This event is bounded by the analysis of the turbine trip presented in

Section 15.2.3 of the CPSES Final Safety Analysis Report (FSAR). The analysis uses conservative assumptions to demonstrate the capability of pressure relieving devices and to demonstrate core protection margins. The event of August 9, 1996, occurred at 100 percent reactor power, and all systems and components functioned as designed. The event is bounded by the FSAR accident analysis which assumes an initial power level of 102 percent and conservative assumptions which reduce the capability of safety systems to mitigate the consequences of the transient. It is concluded that the event of August 9,

1996, did not adversely affect the safe operation of CPSES Unit 1 or the health and safety of the public.

IV. CAUSE OF THE EVENT

The reactor trip was automatically generated due to an electrical spike on Reactor Coolant System loop 4 cold leg temperature (Channel IV) reading high, which was caused by a severe weather lightning strike. With Power Range Channel N-43 (Channel III) in test, the spike completed the two out of four logic for an automatic reactor trip on Overtemperature N-16.

TU Electric believes that a contributing factor which may have caused this event was that, the control room staff was not aware of the rapid change in the weather. Moreover, the suspension of the Power Range Channel N-43 could have been delayed until the severe weather had subsided.

V. CORRECTIVE ACTIONS

A bypass modification to allow Reactor Protection System (EIIS:(JE))/ Engineered Safety Features Channel testing in 'bypass', as opposed to 'trip' has been scheduled. This modification has already been implemented at CPSES Unit 2. The bypass feature may have prevented this reactor trip while one channel was under test condition.

Managements expectations will be issued to plant personnel with respect to scheduling of tests/surveillances, which could impact

plant operations during severe weather.

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Moreover, TU Electric is evaluating various methods to enhance the control room weather monitoring systems (e.g., dedicated radar channel, other electronic weather monitoring system to supplement existing system, etc., etc.,)

VI. PREVIOUS SIMILAR EVENTS

There have been previous events that resulted in RPS actuation due to lightning strikes (refer to LER 445/90-028-00; LER 445/91-019-00, LER 445/91-021-00 and LER 445/95-002-00). However, the details of previously reported events are sufficiently different from the events described in the subject LER, such that previous corrective actions could not have prevented this event.

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Log # TXX-96454

File # 10200

TUELECTRIC Ref. 10CFR50.73(a)(2)(iv)

C. Lance Terry September 6, 1996

Group Vice President

U. S. Nuclear Regulatory Commission

Attn: Document Control Desk

Washington, DC 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)

DOCKET NO. 50-445

ACTUATION OF REACTOR PROTECTION SYSTEM

LICENSEE EVENT REPORT 445/96-007-00

Gentlemen:

Enclosed is Licensee Event Report (LER) 96-007-00 for Comanche Peak Steam Electric Station Unit 1 "Automatic Reactor Trip Caused by Lightning Strike."

Sincerely,

C. L. Terry

By: James J. Kelley, Jr.

Vice President,

Engineering & Support

OB:ob

Enclosure

cc: Mr. L. J. Callan, Region IV

Mr. J. I. Tapia, Region IV

Resident Inspectors, CPSES

P. O. Box 1002 Glen Rose, Texas 76043

*** END OF DOCUMENT ***